ORDER NO. HAD 85062572C8

Service Manual

Automatic Turntable System

Turntable System

SL-BD21

Color

(S)..... Silver Type
(K) .... Black Type

Color	Areas
(S) (K)	[E] ..... Switzerland and Scandinavia.
(S) (K)	[EK] .... United Kingdom.
(S) (K)	[XL] .... Australia.
(S) (K)	[EG] ... F.R. Germany.
(S) (K)	[EB] .... Belgium.
(S) (K)	[EH] .... Holland.
(S) (K)	[EF] .... France.
(S) (K)	[Ei] ..... Italy.
(S) (K)	[EC] .... Czechoslovakia.
(S) (K)	[XA] .... Southeast Asia, Oceania, Africa, Middle Near East and Central South America.

T4P is the standard mark for plug-in-connector system. Products carrying this mark are interchangeable and compatible with each other.

SPECIFICATIONS

■ Turntable section

Type: Automatic turntable
Auto return
Auto stop
Drive method: Belt drive
Motor: DC motor
Drive control method: DC servo controll
Turntable platter: Aluminum die-cast
Diameter 31.2 cm
(12-9/13")
Turntable speeds: 33-1/3 rpm and 45 rpm
Wow and flutter: 0.045% WRMS (JIS C5521)
±0.06% peak
(IEC 98A Weighted)
Rumble: −70 dB (IEC 98A Weighted)

■ Tonearm section

Type: Statically-balanced straight tonearm
Plug-in connector cartridge system
Effective length: 230 mm (9-1/16")
Overhang: 15 mm (19/32")
Tracking error angle: Within 2°32′ at the outer groove of 30 cm (12") record
Within 0°32′ at the inner groove of 30 cm (12") record
Effective mass: 13.5 g (including cartridge)
7.5 g (without cartridge)
Stylus pressure: 1.25 g (Fixed)
Applicable cartridge weight: 6 g

■ Cartridge section

Type: Moving magnet stereo cartridge
Magnet circuit: All laminated core
Frequency response: 10 Hz~30 kHz
20 Hz~10 kHz±1 dB
Output voltage: 2.5 mv at 1 kHz, 5 cm/s. zero to peak lateral velocity
(7 mV at 1 kHz, 10 cm/s. zero to peak 45° velocity [DIN 45 500]
Channel separation: 22 dB at 1 kHz
Channel balance: Within 2 dB at 1 kHz
Recommended load impedance: 47 kΩ~100 kΩ
Compliance (dynamic): 12×10^{-6} cm/dyne at 100 Hz
Stylus pressure range: 1.25±0.25 g (12.5±2.5 mN)
Weight: 6 g (cartridge only)
Replacement stylus: EPS-24CS

■ General

Power supply: For United Kingdom and Australia: 240V AC, 50 Hz
For continental Europe: 220V AC, 50 Hz
For others: ~110-127/220-240V, AC 50/60 Hz
Power consumption: 2W
Dimensions: (W×H×D) 43×9.3×37.5 cm
Maximum height when dust cover is open.
43×36×41 cm
Weight: 3.6 kg (7.9 lb.)

Specifications are subject to change without notice for further improvement.

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

TECHNISCHE DATEN

■ Plattenspieler

Typ:	Automatischer Plattenspieler Rückführautomatik Stopautomatik
Antrieb:	Riemenantrieb
Motor:	Gleichstrommotor
Antriebsregel-Methode:	Gleichstrom-Servo-Steuerung
Plattenteller:	Aluminium-Spritzguß Durchmesser 31,2 cm
Plattenteller-Drehzahlen:	33-1/3 und 45 U./min.
Gleichlaufschwankungen:	0,045% WRMS (JIS C5521) ±0,06% Spitze (IEC 98A bewertet)
Rumpeln:	−70 dB (IEC 98A bewertet)

■ Tonarm

Typ:	Statisch balancierter, gerader Tonarm Tonabnehmersystem vom Einsteck-Typ
Effektive Länge:	230 mm
Überhang:	15 mm
Spurfehlwinkel:	2°32' bei der Einlaufrille einer 30 cm-Plate 0°32' bei der Auslaufrille einer 30 cm-Plate
Effektive Masse:	13,5 g (einschließlich Tonabnehmer) 7,5 g (ohne Tonabnehmer)
Nadeldruck-Einstellbereich:	1,25 g (nicht einstellbar)
Zulässiges Tonabnehmer-gewicht:	6 g

■ Tonabnehmer

Typ:	Beweglicher Magnet-Stereo-Tonabnehmer
Magnetkreis:	Ganzlamellenkern
Frequenzgang:	10 Hz~30 kHz 20 Hz~10 kHz±1 dB
Ausgangsspannung:	2,5 mV bei 1 kHz 5 cm/s. Null-zu-Spitze, lateral [7 mV bei 1 kHz 10 cm/s. Null-zu-Spitze, 45° (DIN 45 500)]
Kanaltrennung:	22 dB bei 1 kHz
Kanalabweichung:	Innerhalb 2 dB bei 1 kHz
Empfohlene Endimpedanz:	47 kΩ~100 kΩ
Nachgiebigkeit (dynamisch):	12×10^{-6}cm/dyn bei 100 Hz
Nadeldruck bereich:	1,25±0,25 g (12,5±2,5 mN)
Gewicht:	6 g (nur Tonabnehmer)
Ersatznadel:	EPS-24CS

■ Allgemeine Daten

Stromversorgung:	220 V, 50 Hz Wechselstrom
Leistungsaufnahme:	2W
Abmessungen: (B×H×T)	43×9,3×37,5 cm Maximale Höhe bei geöffnetem Oberteil (Abdeckhaube) 43×36×41 cm
Gewicht:	3,6 kg

Die technischen Daten können infolgen von Verbesserungen ohne Ankündigung geändert werden.

CARACTERISTIQUES

■ Platine de lecture

Type:	Platine automatique Retour automatique Arrêt automatique
Système d'entrainement:	Entraînement par courroie
Moteur:	Moteur C.C.
Groupe de réglage:	Servocommande du C.C. de frequences
Plateau de lecture:	En aluminium moulé sous pression Diamètre 31,2 cm
Vitesses de rotation:	33-1/3 et 45 t/p.m.
Pleurage et scintillement:	0,045% de valeur efficace (JIS C5521) ±0,06% de crête (IEC 98A pondéré)
Ronflement:	−70 dB (IEC 98A pondéré)

■ Bras de lecture

Type:	Bras de lecture rectiligne statiquement équilibré. Système de cellule de lecture à connecteur enfichable.
Longueur effective:	230 mm
Porte-à-faux:	15 mm
Angle d'erreur de piste:	En deçà de 2°32' au sillon extérieur d'un disque de 30 cm En deçà de 0°32' au sillon intérieur d'un disque de 30 cm
Masse réelle:	13,5 g (y compris la cellule pick-up) 7,5 g (sans la cellule pick-up)
Plage de réglage de la pression d'appui:	1,25 g (Fixé)
Poids des cellules pick-up utilisables:	6 g

■ Cellule pick-up

Type:	Cellule pick-up stéréo à aimant mobile
Circuit magnétique:	Noyau entièrement feuilleté
Réponse en fréquence:	10 Hz~30 kHz 20 Hz~10 kHz±1 dB
Tension de sortie:	2,5 mV à 1 kHz; 5 cm/s., zéro à vitesse latérale de crête (7 mV à 1 kHz, 10 cm/s., zéro à vitesse 45° de crête [DIN 45 500])
Séparation des canaux:	22 dB à 1 kHz
Equilibrage des canaux:	En deçà de 2 dB à 1 kHz
Impédance de charge recommandée:	47 kΩ ~ 100 kΩ
Elasticité (dynamique):	12×10^{-6} cm/dyne à 100 Hz
Plage de la force verticale d'appui:	1,25±0,25 g (12,5±2,5 mN)
Poids:	6 g (cellule seule)
Pointe de lecture de remplacement:	EPS-24CS

■ Généralités

Alimentation: Alternatif 220V, 50 Hz
Consommation: 2W
Dimensions: 43×9,3×37,5 cm
(L×H×P) Hauteur maximum lorsque le couvercle protège-poussière est ouvert:
43×36×41 cm
Poids: 3,6 kg

Sujet à changement sans prearis.

ESPECIFICACIONES

■ Sección del plato giratorio

Tipo: Plato giratorio automático
Retorno automático
Parada automática
Método de accionamiento: Accionamiento por correa
Motor: Motor de corriente continua
Método de control de accionamiento: Servocontrol por generador de corriente continua
Platillo del plato giratorio: Aluminio fundido
Diámetro 31,2 cm
Velocidades del plato giratorio: 33-1/3 y 45 rpm
Ululaciones y trémolo: 0,045% WRMS (JIS C5521)
±0,06% cresta (IEC 98A Ponderado)
Ruido de rodadura: −70 dB (IEC 98A Ponderado)

■ Sección del brazo sonoro

Tipo: Brazo sonoro recto con equilibrio estático
Sistema de cartucho con conector enchufable
Longitud efectiva: 230 mm
Proyección: 15 mm
Angulo de error de seguimiento: Inferior a 2°32' en el surco exterior de un disco de 30 cm
Inferior a 0°32' en el surco interior de un disco de 30 cm
Masa efectiva: 13,5 g (incluyendo el cartucho)
7,5 g (sin cartucho)
Presión de la aguja: 1,25 g (Fija)
Preso de cartucho utilizable: 6 g

■ Sección del cartucho

Tipo: Cartucho estereofónico de imán móvil
Circuito magnético: Núcleo totalmente laminado
Respuesta de frecuencia: 10 Hz~30 kHz
20 Hz~10 kHz±1 dB
Voltaje de salida: 2,5 mV a 1 kHz
Con velocidad lateral de cero a cresta de 5 cm/s
[7 mV a 1 kHz Velocidad de 45° de cero a cresta de 10 cm/s (DIN 45 500)]
Separación de canales: 22 dB a 1 kHz
Equilibrio de canales: Sin exceder 2 dB a 1 kHz
Impedancia de carga recomendada: 47 kΩ a 100 kΩ
Elasticidad (dinámica): 12×10^{-6}cm/dina a 100 Hz
Radio de presión de la aguja: 1,25±0,25 g (12,5±2,5 mN)
Peso: 6 g (cartucho sólo)
Aguja de recambio: EPS-24CS

■ En general

Alimentación de corriente: ~110-127/220-240V, 50 ó 60 Hz
Consumo de corriente: 2W
Dimensiones: 43×9,3×37,5 cm
(Ancho×Alto×Prof.) Altura máxima cuando la tapa contra el polvo está abierta:
43×36×41 cm
Peso: 3,6 kg

Estas especificaciones estàn sujetas a cualquier cambio sin previo eviso.

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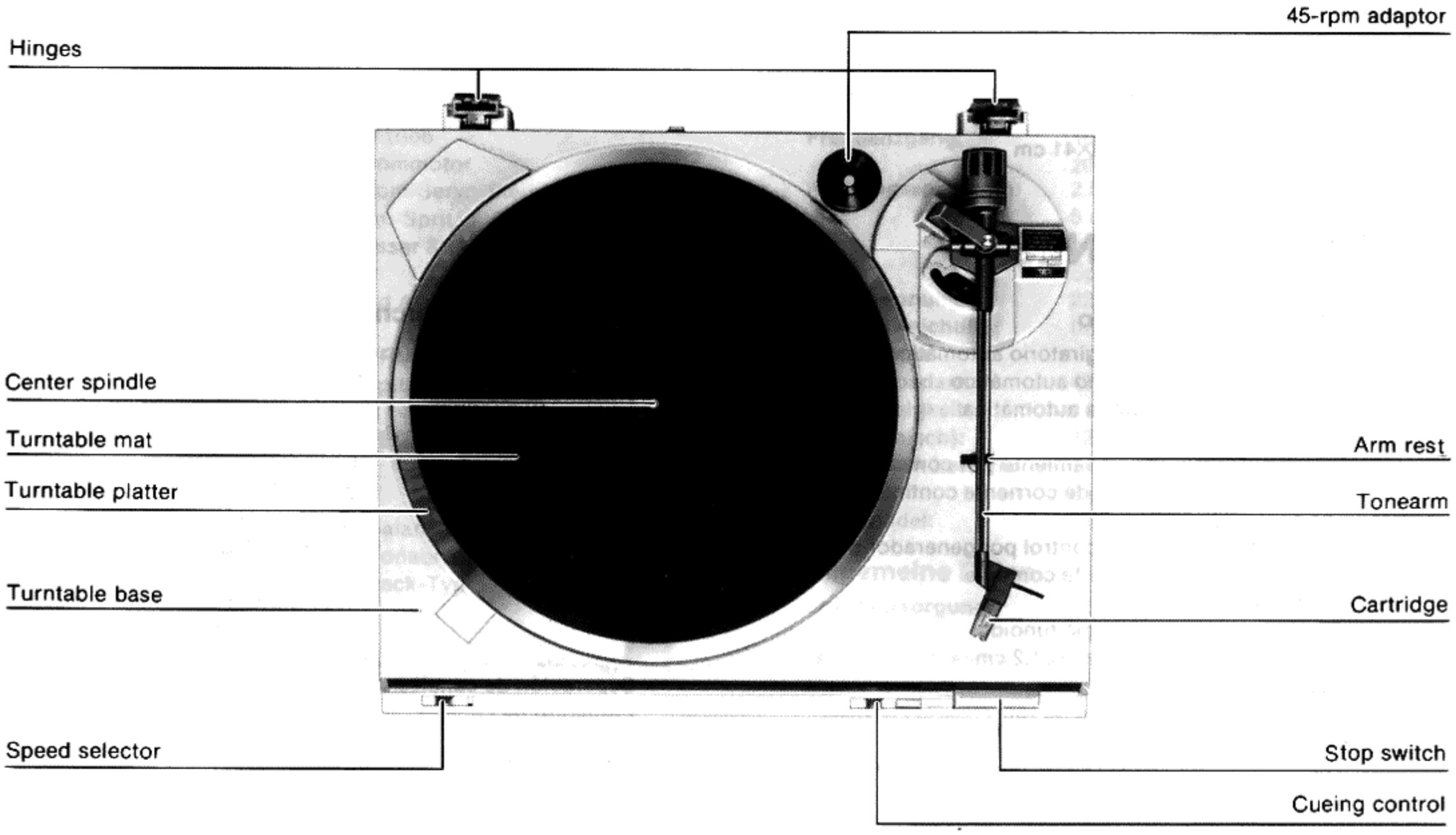
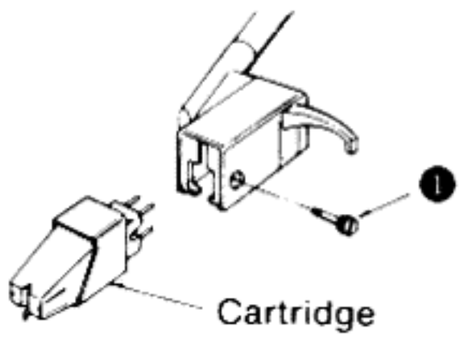
■ LOCATION OF CONTROLS

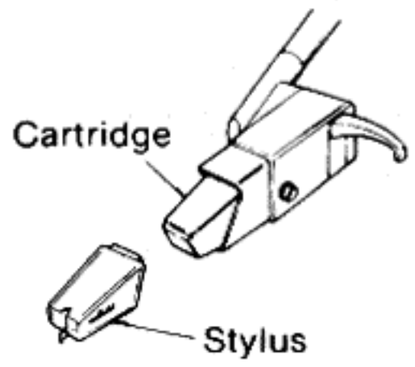


■ DISASSEMBLY INSTRUCTIONS

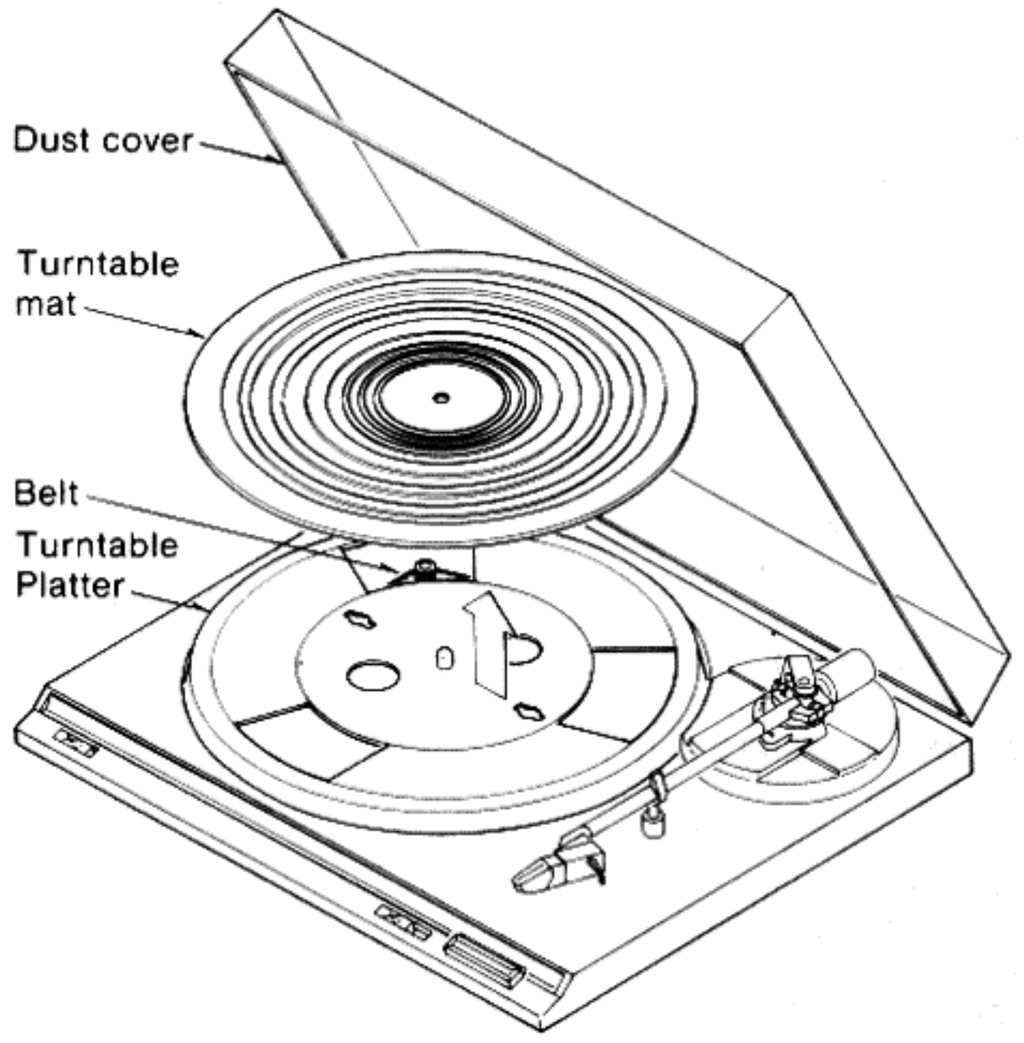
Ref. No 1	How to remove the cartridge
Procedure 1	1. Remove the setscrew ❶. 2. Pull out the cartridge, taking care that your hand does not touch the stylus tip.



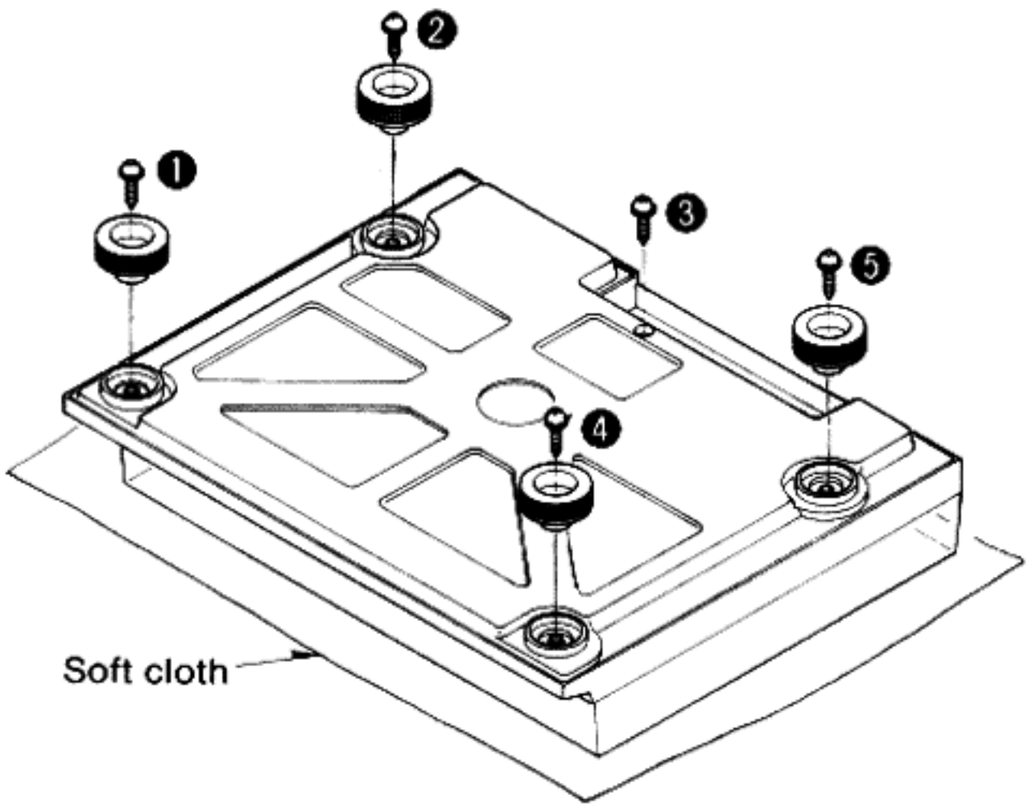
Ref. No 2	How to remove the stylus
Procedure 2	• Pull out the stylus, taking care not to touch the stylus tip.



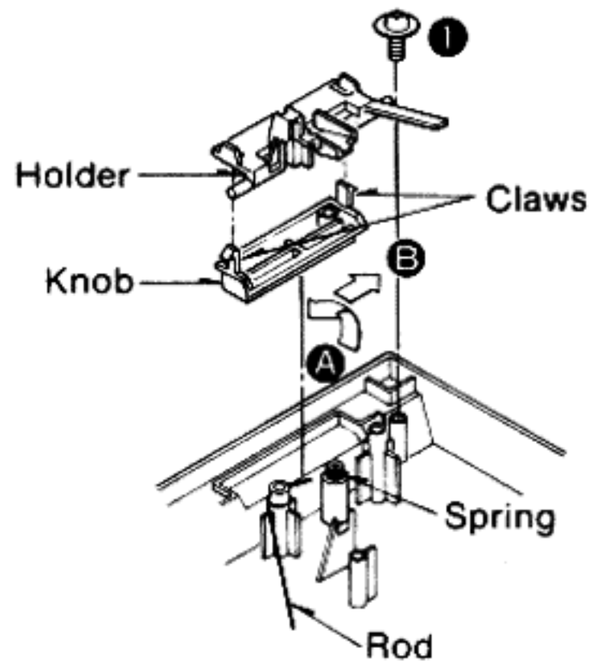
Ref. No 3	How to remove the turntable platter
Procedure 3	1. Open the dust cover and remove the turntable mat. 2. Remove the belt 3. Lift up the turntable platter.



Ref. No 4	How to remove the bottom board
Procedure 3 ➧ 4	1. Turn over the unit on a soft cloth. 2. Remove the 5 setscrews (❶ ~ ❺)

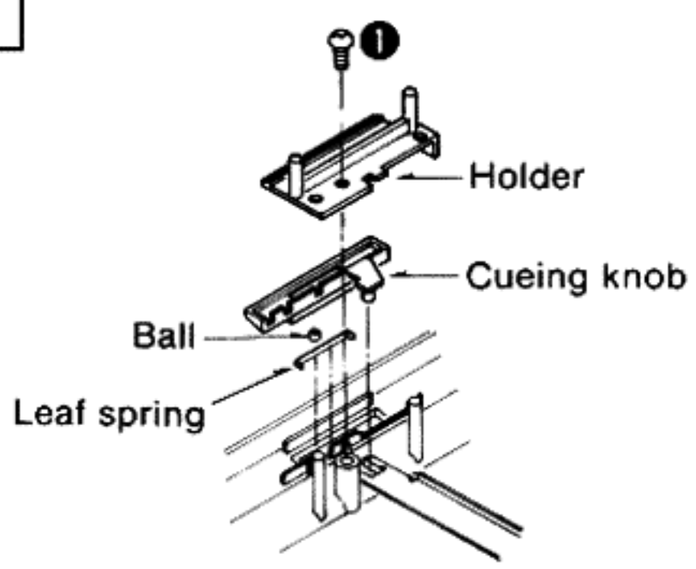


Ref. No 6	How to remove the power switch knob
Procedure 3 ➧ 4 ➧ 6	1. Remove the setscrew ❶. 2. Remove the holder (with knob) in the direction of the arrows (Ⓐ, Ⓑ). 3. Release the 2 claws.



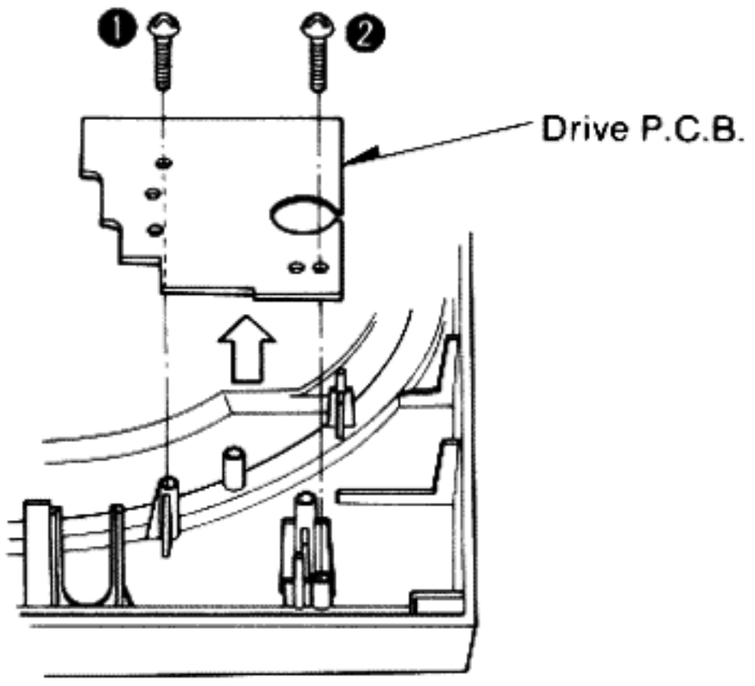
Note:
When attaching the stop knob, do not forget to attach the spring.

Ref. No 5	How to remove the cueing knob
Procedure 3 ➧ 4 ➧ 5	• Remove the setscrew ❶.

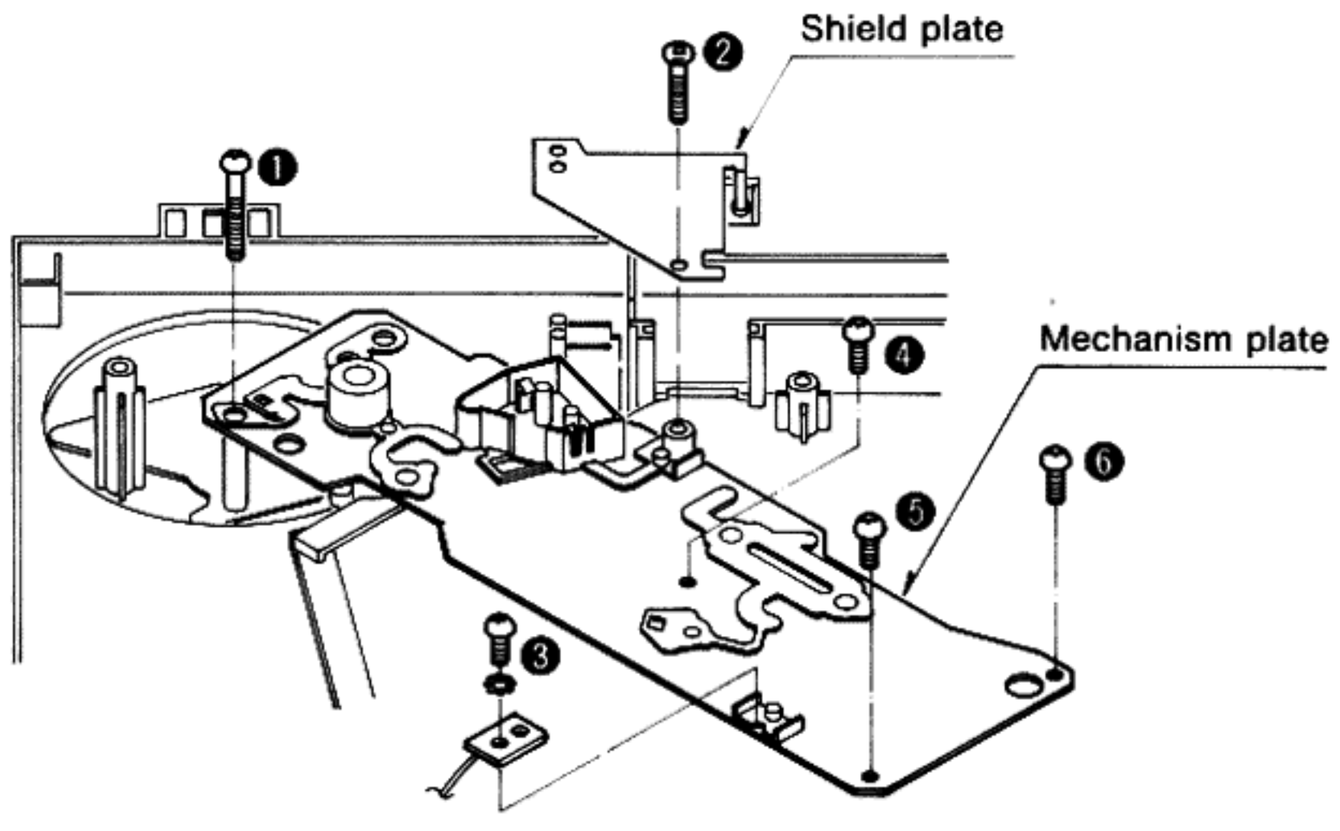


Caution:
When removing the cueing knob, please note the ball bearing which is held between the leaf spring and knob and take care not to drop or lose it.

Ref. No 7	How to remove the drive P.C.B.
Procedure 3 ➧ 4 ➧ 7	1. Remove the 2 setscrews (❶ ~ ❷). 2. Remove the drive P.C.B. in the direction of the arrow.



Ref. No 8	How to remove the mechanism plate
Procedure 3 ➧ 4 ➧ 8	1. Remove the 6 setscrews (❶ ~ ❻). 2. Lift up the mechanism plate.

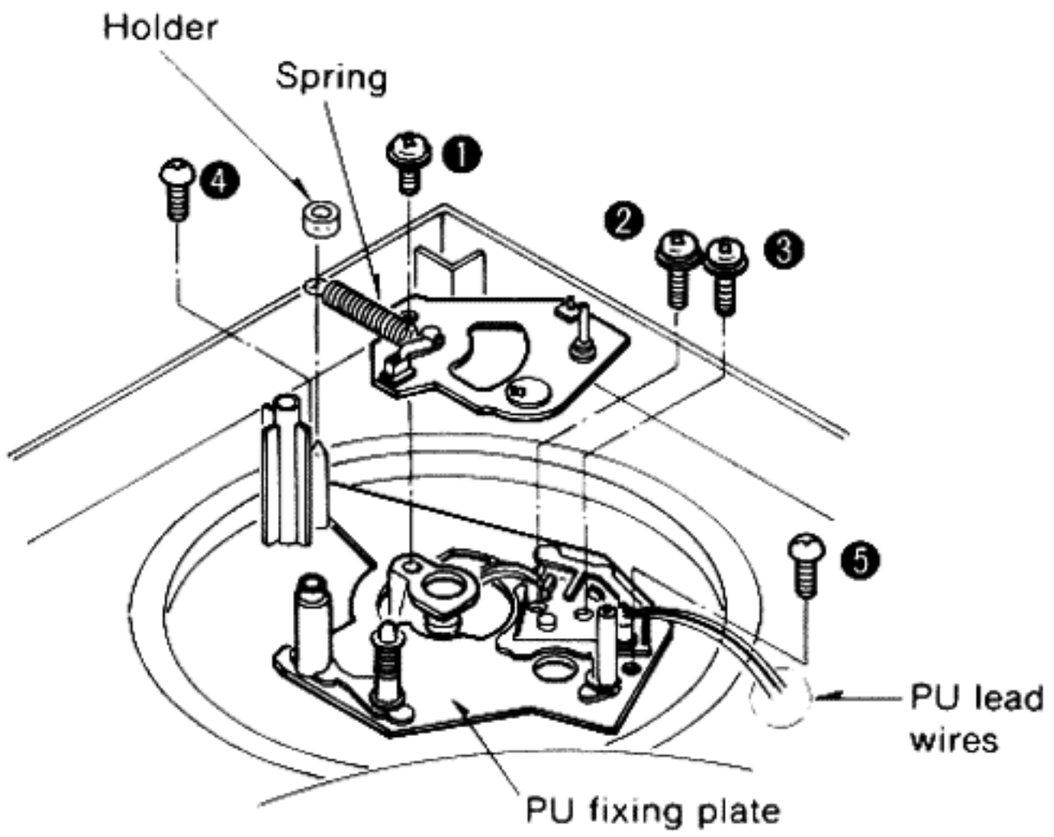


Ref. No 9	How to remove the tonearm and PU fixing plate
Procedure 3➧4➧8➧9	

1. Unsolder the 5 PU lead wires from the phono terminal.
2. Remove the spring holder.
3. Remove the setscrew ❶.
4. To remove the tonearm, remove the 2 setscrews (❷, ❸).
5. To remove the PU fixing plate, remove the 2 setscrews (❹, ❺).

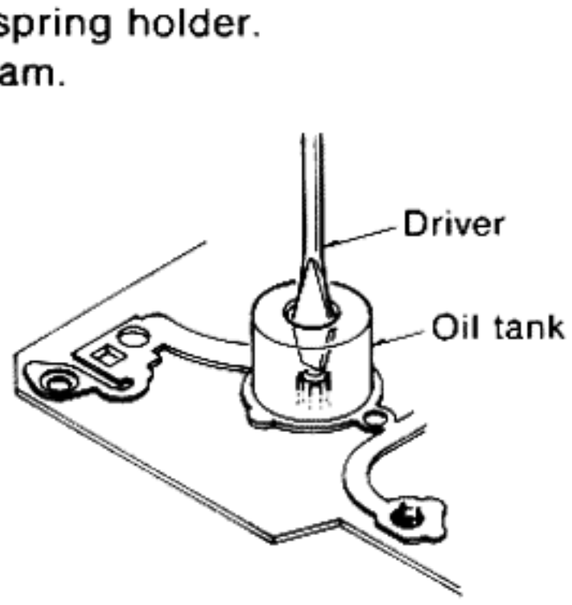
* PU lead wiring method

White .....L channel (+) terminal
Blue.....L channel (−) terminal
Red .....R channel (+) terminal
Green .....R channel (−) terminal
Black.....Ground terminal



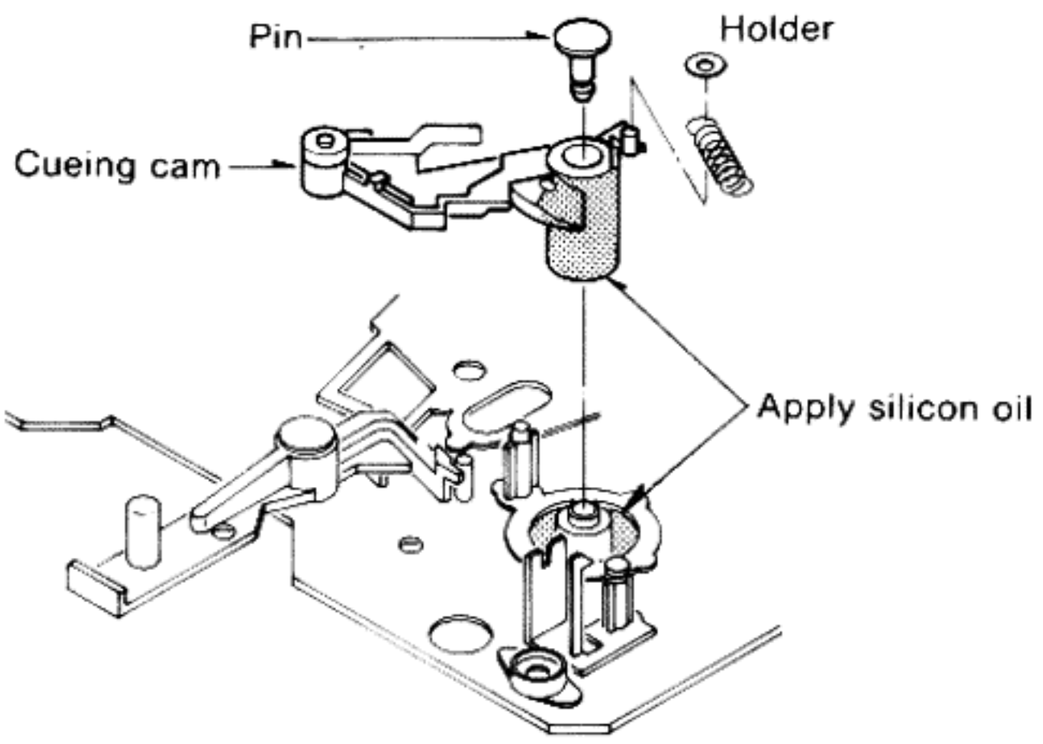
Ref. No 10	How to remove the cueing cam
Procedure 3➧4➧8➧10	

1. Push the pin with a driver.
2. Remove the pin and spring holder.
3. Remove the cueing cam.



Note:
If the cueing time of the tonearm becomes too short, or if the cueing cam is replaced, apply silicon oil (Part No. SZZ0L12) according to the following procedure.

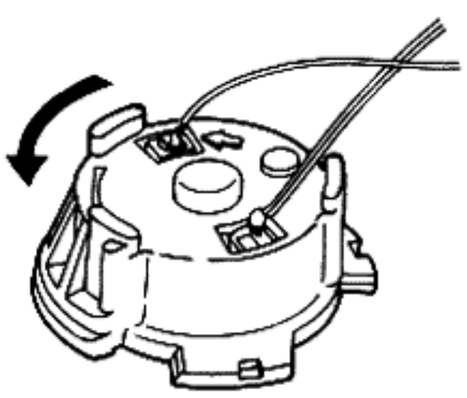
1. Remove the cueing cam.
2. Apply silicon oil to the cueing cam and oil tank.

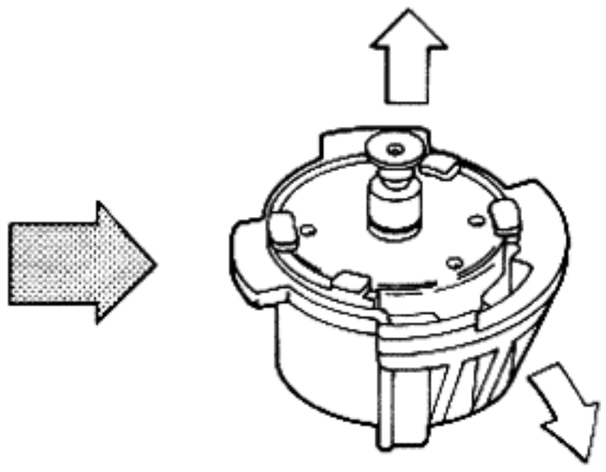


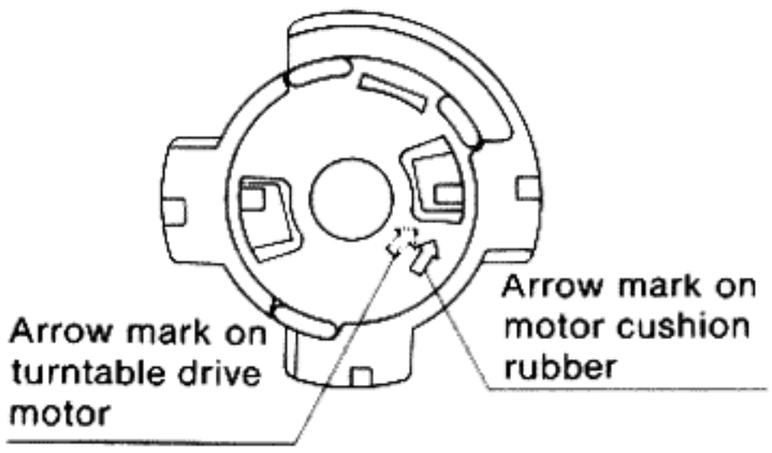
Ref. No 11	How to remove the turntable drive motor
Procedure 3 ➧ 4 ➧ 11	

1. Remove the motor assembly in the direction of the arrow.
2. Unsolder the 2 lead wires from the motor.
3. Pull out the motor from cushion rubber.

Notes:
1. When attaching the turntable drive motor to the cushion rubber, match the arrow marks.
2. Connections of the turntable drive motor:
   FC3 ① terminal...(+) terminal of the motor
   FC3 ② terminal...(−) terminal of the motor
   The arrow mark indicates the (−) terminal

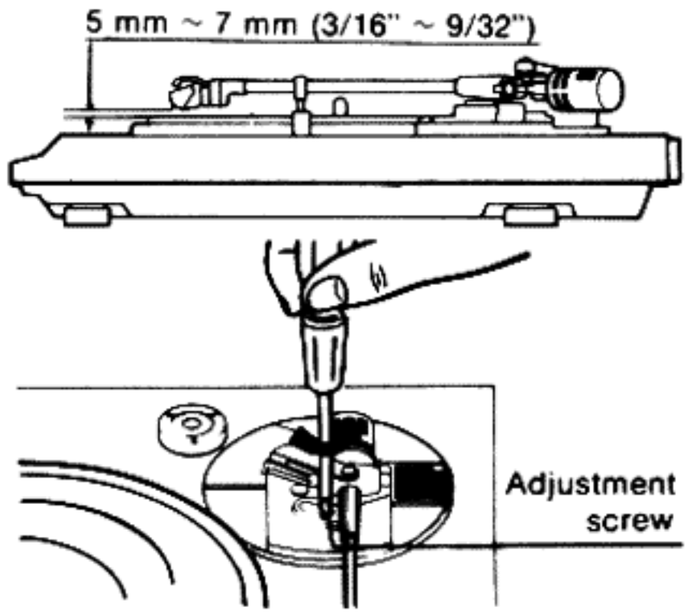






- **Arm-lift height adjustment**

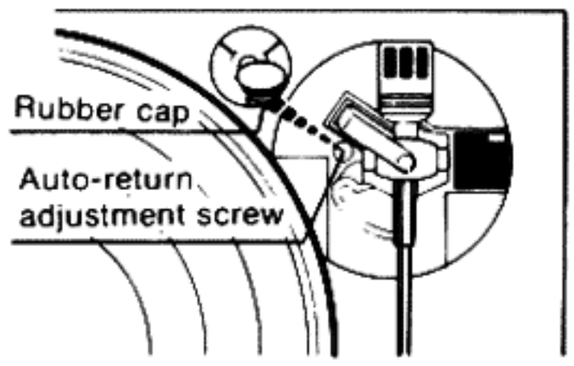
The arm-lift height (distance between the stylus tip and the record surface when the cueing control is at the "▽" position) has been adjusted at the factory to approximately 5 to 7 mm (3/16"—9/32").
If the clearance is too narrow or too wide, turn the adjustment screw clockwise or counterclockwise.
Clockwise rotation
—distance between the record and stylus tip is decreased.
Counterclockwise rotation
—distance between the record and stylus tip is increased.



- **Automatic return adjustment**

1. Clamp the tonearm to the arm rest.
2. Remove the rubber cap.
3. Turn the screw with a screwdriver, clockwise or counter-clockwise as necessary.

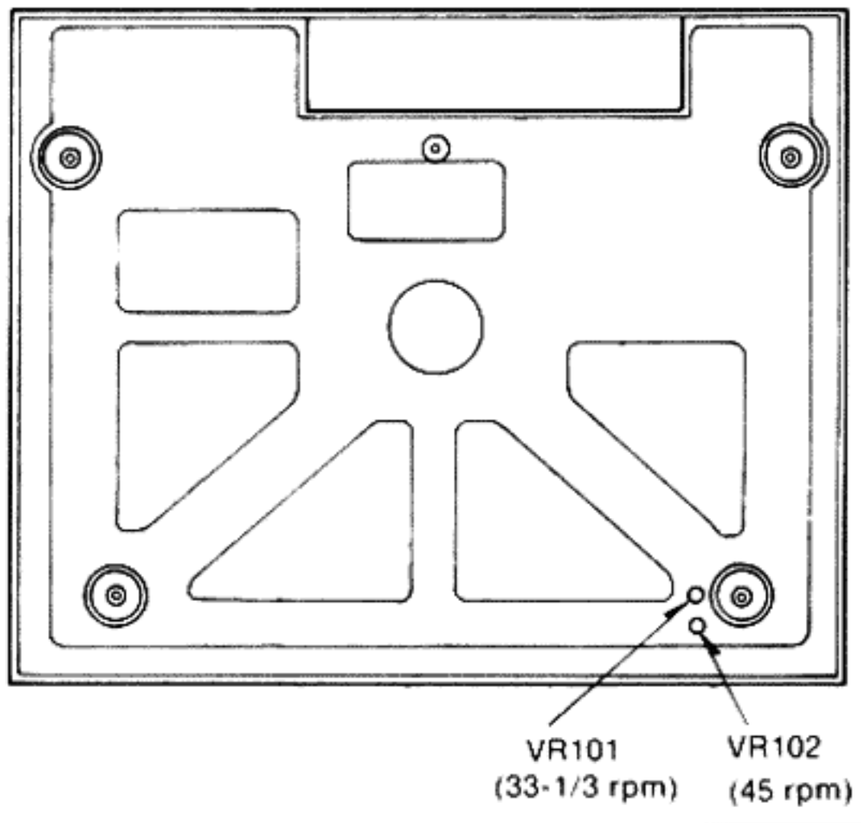
If the tonearm tends to return to the arm rest before the play has finished,
—turn counterclockwise.
If the tonearm fails to return after the final groove,
—turn clockwise.



- **Rotating speed**

When the turntable drive/control IC (IC101) or the variable resistors (VR101, 102) are changed, adjust the rotating speed in the following procedure.
1. Set the speed selector switch to the "33" position.
2. Turn VR101 with a screwdriver from the bottom of the set to the rated rotation (33-1/3 rpm) and check the rotation with a strobe while adjusting the speed.
3. Set the speed selector switch to the "45" position.
4. Turn VR102 with a screwdriver from the bottom of the set to the rated rotation (45 rpm) and check the rotation with a strobe while adjusting the speed.

Note: Be sure to make the adjustment for 33-1/3 rpm first.

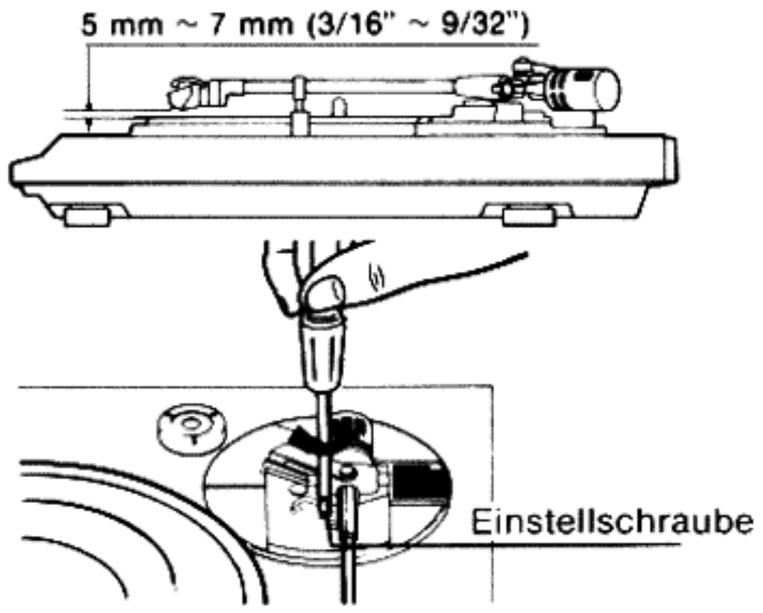


• **Justierung der Tonarmlifthöhe**

Die Tonarmlifthöhe, d.h. der Abstand zwischen Nadelspitze und Schallplattenoberfläche bei Liftsteuerungs-Position "▽", wurde werkseitig auf ca. 5—7 mm eingestellt. Falls der Abstand zu groß oder zu klein ist, drehen Sie die Justierschraube im Uhrzeigersinn oder entgegen dem Uhrzeigersinn.

Drehung im Uhrzeigersinn
—Der Abstand zwischen der Platte und der Nadelspitze wird kleiner.

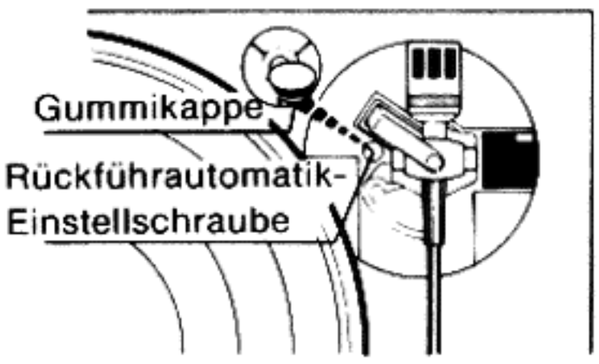
Drehung entgegen dem Uhrzeigersinn
—Der Abstand zwischen der Platte und der Nadelspitze wird größer.



• **Justierung des Abschaltpunktes der Automatik**

1. Setzen Sie zuerst den Nadelschutz auf.
2. Die Gummikappe abnehmen.
3. Führen Sie den Tonarm gegen die Plattenmitte.
   Die Justierschraube für den Abschaltpunkt der Automatik wird dann sichtbar.

Falls der Tonarm zu früch zurückkehrt:
—Entgegen dem Uhrzeigersinn drehen.
Falls der Tonarm nach Erreichen der Auslaufrille nicht zurückkehrt:
—Im Uhrzeigersinn drehen.

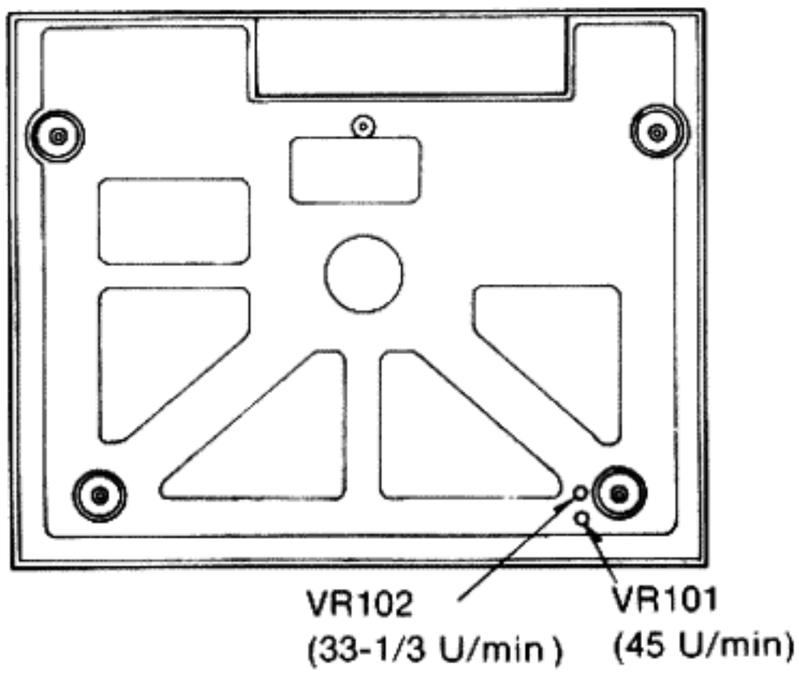


• **Drehzahl**

Wenn das Plattenteller-Antriebs-/Regel-IC (IC101) oder der Drehwiderstand (VR101, 102) ausgetauscht wird, oder wenn die Nenndrehzahl auch durch Drehen Drehzahlreglers nicht erreicht werden kann, so ist die Drehzahl auf folgende Weise zu justieren.

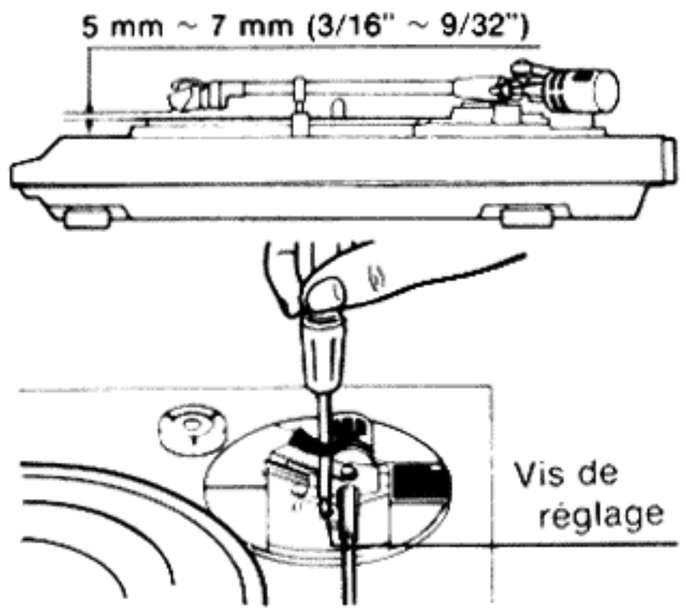
1. Den Drehzahl-Wahlschalter in die "45"-Position stellen.
2. VR101 von der Unterseite des Gerätes her mit einem Schraubendreher auf die Nenndrehzahl (45 U/min) drehen und die Drehzahl während der Justierung mit einem Stroboskop prüfen.
3. Den Drehzahl-Wahlschalter in die "33"-Position stellen.
4. VR101 von der Unterseite des Gerätes her mit einem Schraubendreher auf die Nenndrehzahl (33 U/min) drehen und die Drehzahl während der Justierung mit einem Stroboskop prüfen.

Anmerkung: Die Justierung für 45 U/min muß unbedingt zuerst durchgeführt werden.



• **Mise au point de la hauteur de l'élévateur du bras**

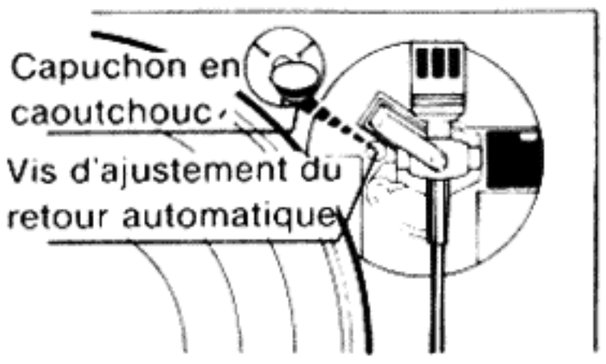
La hauteur de l'élévateur du bras (distance entre l'extrémité de la pointe de lecture et la surface du disque, lorsque la commande de pose et de relevage est à la position "▽") a été réglée en usine sur approximativement 5 à 7 mm.
Si l'écartement est trop étroit ou trop large, tourner la vis de réglage dans le sens des aiguilles d'une montre ou dans le sens contraire.
Rotation dans le sens des aiguilles d'une montre.
—La distance entre la surface du disque et l'extrémité de la pointe de lecture diminue.
Rotation dans le sens contraire des aiguilles d'une montre.
—La distance entre la surface du disque et l'extrémité de la pointe de lecture augmente.



• **Mise au point de la position de retour automatique**

1. Bloquer le bras de lecture sur le support du bras.
2. Retirer le capuchon en caoutchouc.
3. Avec un tournevis, tourner la vis de réglage dans le sens des aiguilles d'une montre ou dans le sens inverse selon la nécessité.

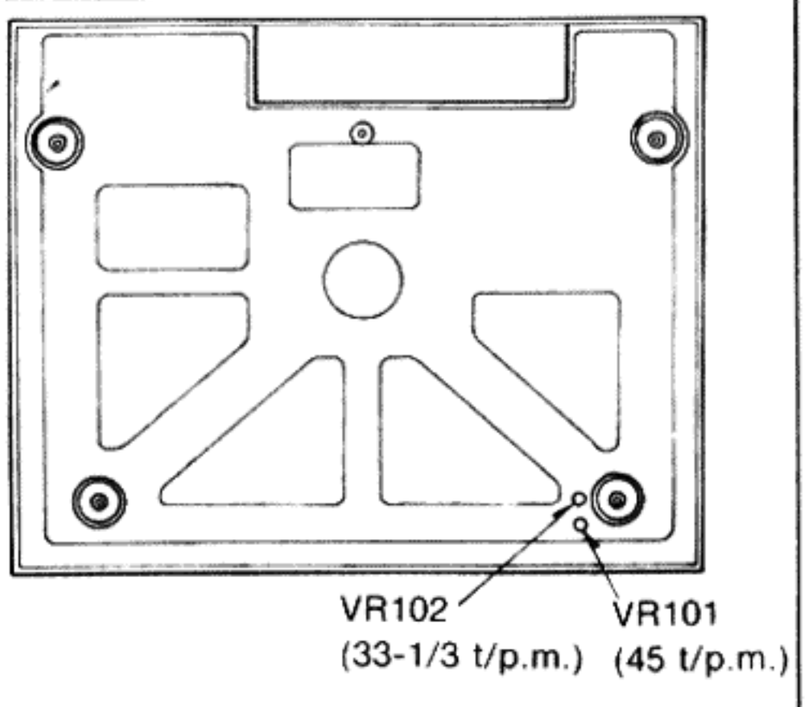
Si le bras de lecture tend à revenir vers le support du bras avant que l'audition ne soit terminée,
—tourner dans le sens contraire des aiguilles d'une montre.
Si le bras de lecture ne peut revenir en arrière après le dernier sillon,
—tourner dans le sens des aiguilles d'une montre.



• **Vitesse de rotation**

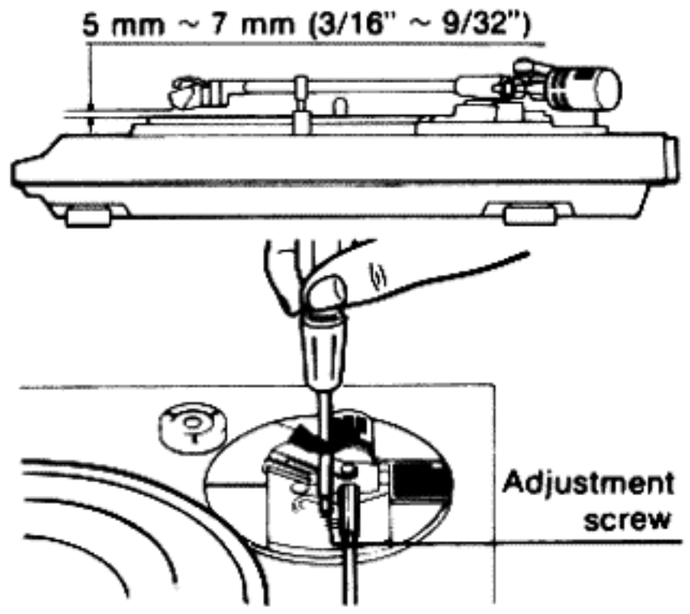
Lorsque le circuit intégré (IC101) de commande/dispositif d'entraînement de la platin ou les résistances variables (VR101, 102) sont changés, ou si la rotation nominale n'est pas atteinte même lorsque la manette de réglage d'écart est tournée, ajuster la vitese de rotation selon la procédure suivante.
1. Régler le commutateur-sélecteur de vitesse sur la position "45".
2. Tourner VR101 avec un tournevis à partir de la face inférieure de l'appareil sur la rotation nominale (45 t/p.m.) et vérifier la rotation avec un stroboscope tout en réglant la vitesse.
3. Régler le commutateur-sélecteur de vitesse sur la position "33".
4. Tourner VR102 avec un tournevis à partir de la face inférieure de l'appareit sur la rotation nominale ((33-1/3 t/p.m.) et vérifier la rotation avec un stroboscope tout en réglant la vitesse.

Nota: S'assurer d'effectuer tout d'abord le réglage pour 45 t/p.m.



• **Ajuste de la altura de elevación del brazo**

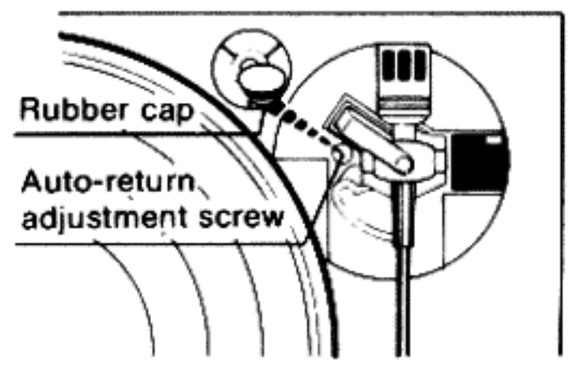
La altura de elevación del brazo (o sea, la distancia entre la punta de la aguja y la superficie del disco cuando el control de colocación está en la posición "▽") ha sido regulada en la fábrica aproximadamente entre 5 y 7 mm.
En caso que la distancia fuese demasiado abundante o demasiado escasa, girar el tornillo de ajuste hacia la derecha o hacia la izquierda.
Rotación hacia la derecha
—reduce la distancia entre el disco y la punta de la aguja.
Rotación hacia la izquierda
—aumenta la distancia entre el disco y la punta de la aguja.



• **Ajuste de la posición para retorno automático**

En caso que la aguja no se depositara en el surco de comienzo, regular de la manera que sigue.
1. Sujetar el brazo sonoro al apoyo del mismo con la grapa.
2. Quitar la tapita de goma.
3. Girar el tornillito de ajuste hacia la derecha o hacia la izquierda usando un destornillador, según sea necesario.

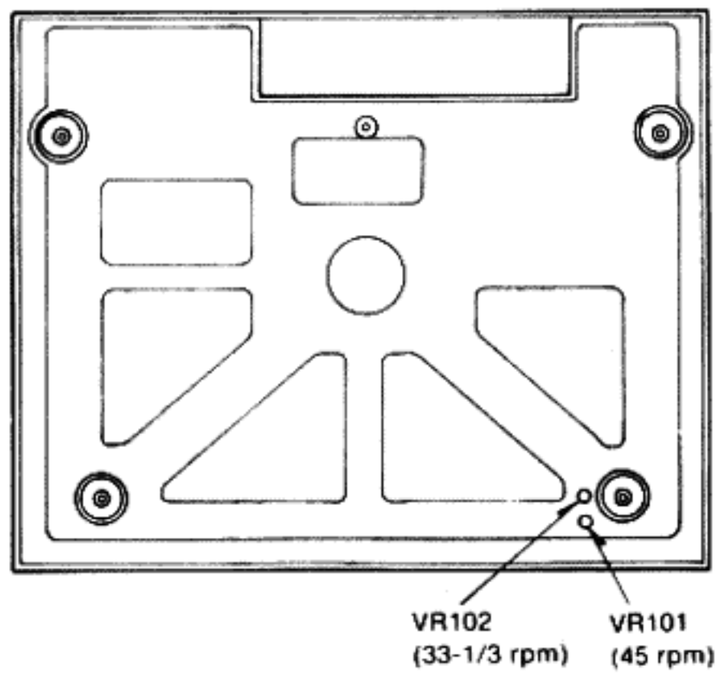
Quando el brazo sonoro tienda a volver a su apoyo antes de terminar la ejecución:
—Girar hacia la izquierda.
En caso que el brazo sonoro no vuelva después de haber tocado el útimo surco del disco:
—Girar hacia la derecha.



• **Velocidad giratoria**

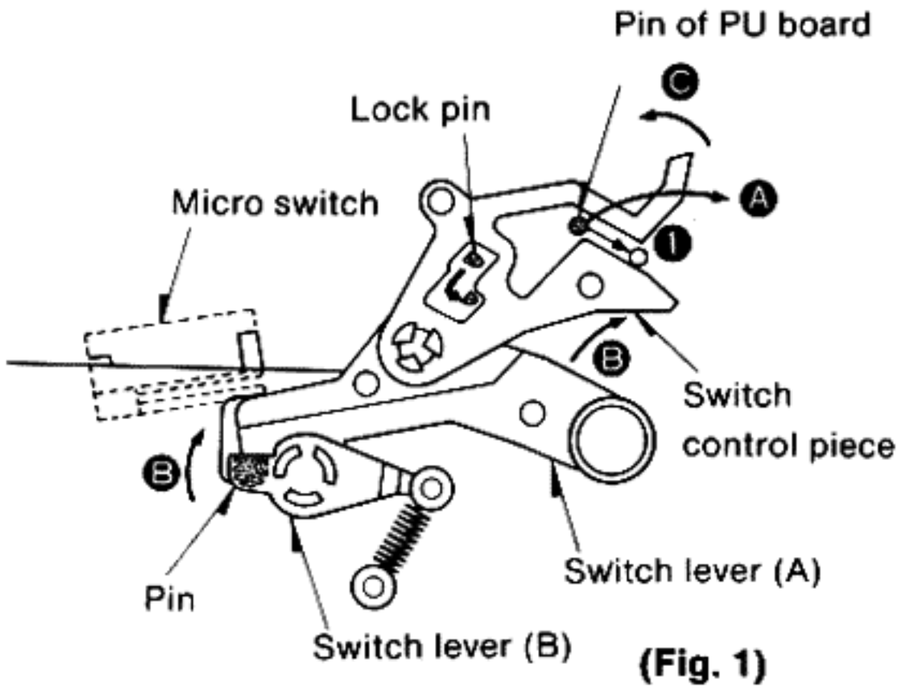
Cuando el CI (IC101) de accionamiento/control del plato giradiscos o los resistores variables (VR101, 102) son cambiados, o si la rotación nominal no es alacanzada, aun cuando la perila de control del paso es girada, ajuste la velocidad giratoria con el siguiente procedimiento.
1. Ponga el interruptor selector de velocidad en la posición "45".
2. Gire VR101 con un destornillador desde la parte inferior del aparato a la velocidad nominal (45 rpm) y compruebe la rotación con un estroboscopio mientras ajusta la velocidad.
3. Ponga el interruptor selector de velocidad en la posición "33".
4. Gire VR102 con un destornillador desde la parte inferior del aparato a la rotación nominal (33-1/3 rpm) y compruebe la rotación con un estroboscopio mientras ajusta la velocidad.

Nota: Asegúrese de hacer el ajuste para 45 rpm primero.



■ OPERATIONAL DESCRIPTION OF MECHANISM

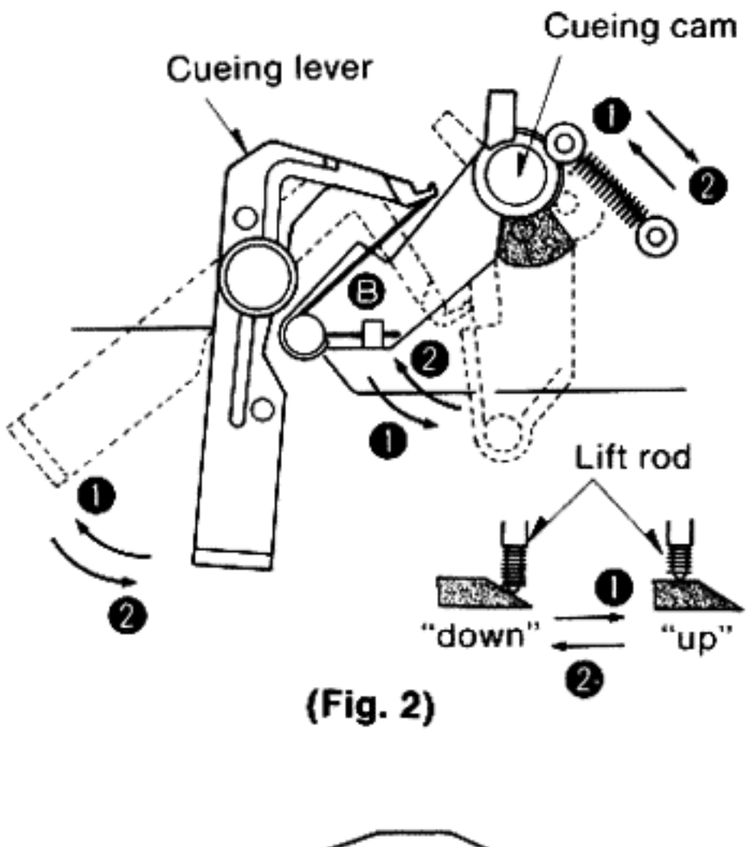
- **Manual start (Fig. 1)**
  1. Shift the tonearm to the turntable side.
     - The PU board rotates and the pin of PU board applies a force to the switch control piece in the direction of arrow Ⓐ.
  2. The switch control piece, switch levers (A) and (B) move in the direction of arrow Ⓑ.
  3. The pin of switch lever (B) holds the contact of microswitch (power).
     - Drive circuit power supply turns ON and motor starts operating.
  4. When the pin of PU board moves to point ❶, the switch control piece moves in the direction of arrow Ⓒ, and the switch control piece is locked by the lock pin of the mechanism board.
     - Microswitch keeps turning ON.



(Fig. 1)

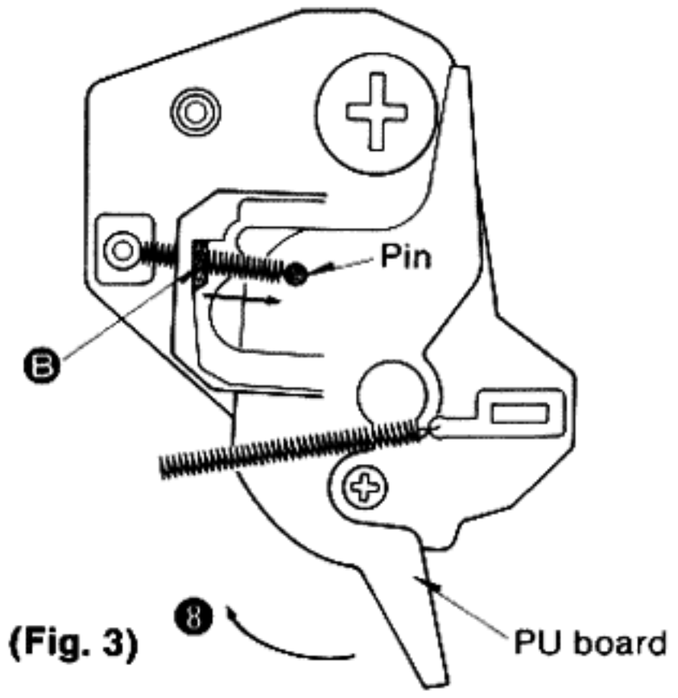
- **Cueing up/down (Fig. 2)**
  1. When the cueing knob is set to up/down position, the cueing lever and cueing cam rotate via the cueing rod.
     - Rotation in the direction of arrow ❶: Cueing up
     - Rotation in the direction of arrow ❷: Cueing down
  2. The lift rod is pushed up or down by the cueing cam operation.

  Note:
  The cueing cam takes about 6~8 sec. to move from point Ⓐ to point Ⓑ. (Cueing up to cueing down)

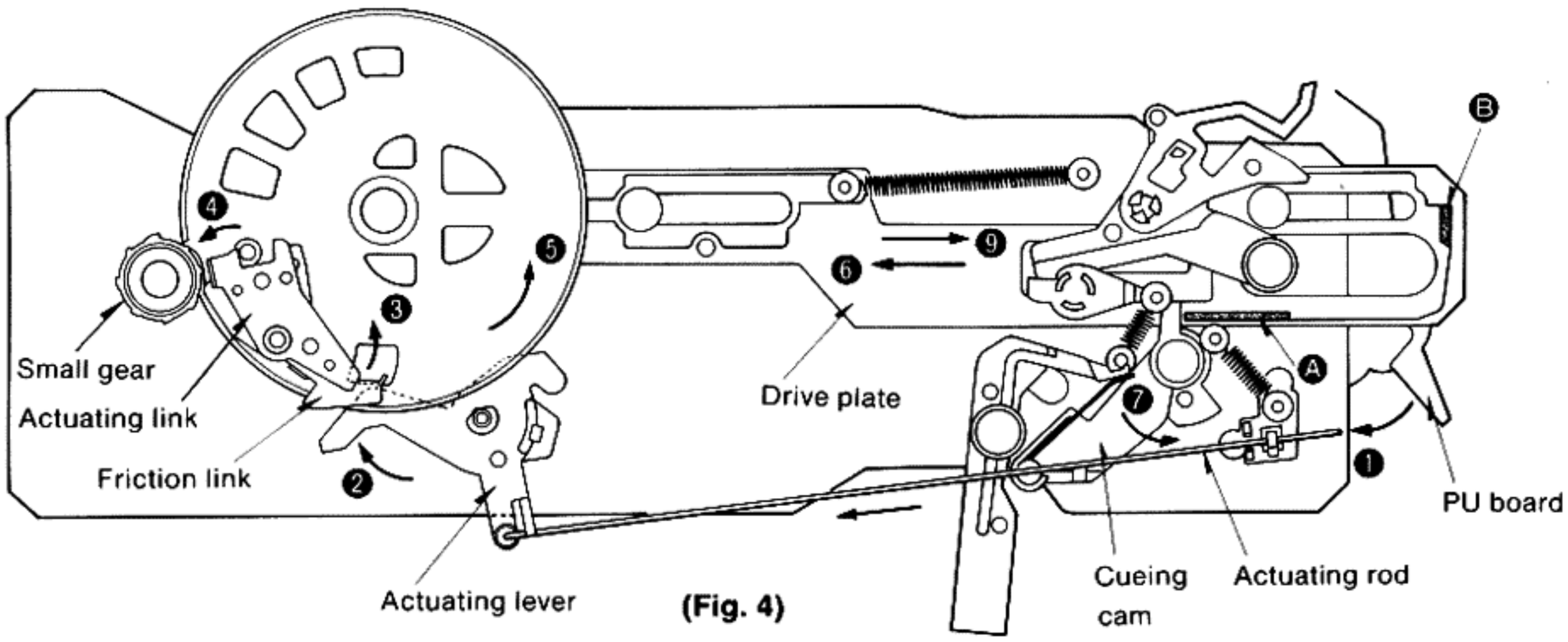


(Fig. 2)

- **Auto return (Fig. 3, 4)**
  1. Tonearm moves to the center of turntable.
     - PU board rotates to hold the actuating rod. (Arrow ❶)
  2. Actuating lever rotates. (Arrow ❷)
     - Friction link and actuating link are pushed out (direcstion ❸ and ❹), then small gear engages with main gear to rotate the latter.
  3. Main gear rotation causes the drive plate to move in the direction of arrow ❻.
     - The projection Ⓐ of drive plate pushes the cueing cam to rotate it for cueing up.
     - The projection Ⓑ of drive plate touches the pin of PU board to rotate it in the direction of arrow ❽, thereby shifting the tonearm back to the rest position.
  4. As the main gear rotates further, drive plate moves in the direction of arrow ❾, thereby resetting the mechanism.

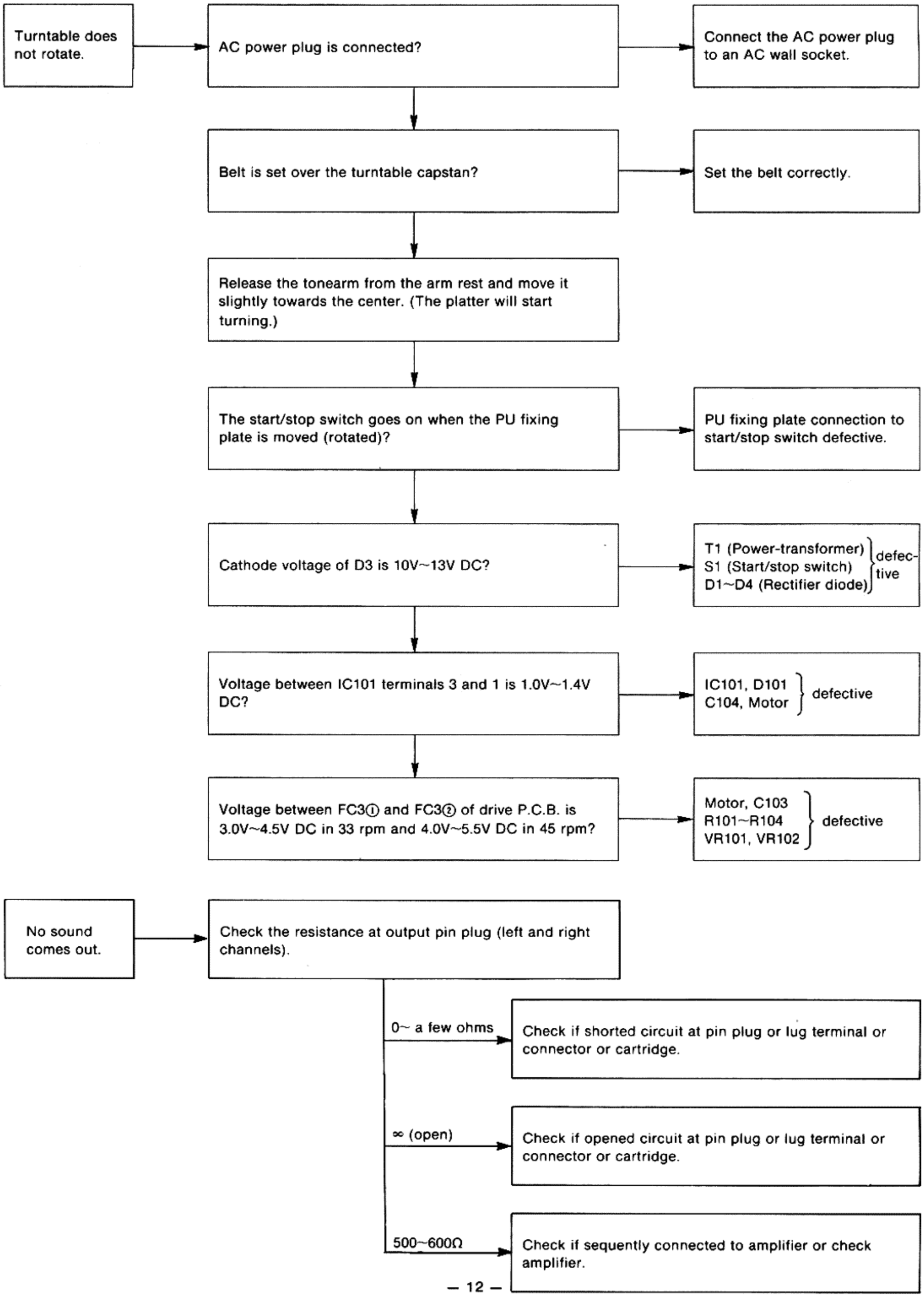


(Fig. 3)

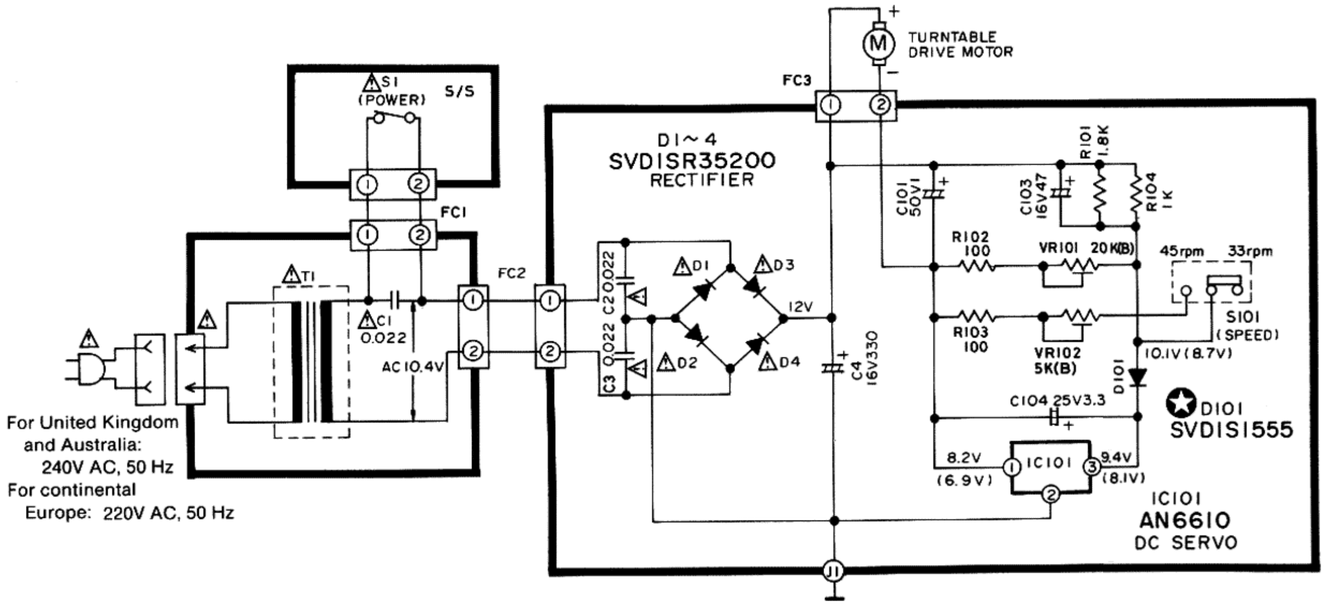


(Fig. 4)

■ TROUBLESHOOTING


Turntable does not rotate.
AC power plug is connected?
Connect the AC power plug to an AC wall socket.
Belt is set over the turntable capstan?
Set the belt correctly.
Release the tonearm from the arm rest and move it slightly towards the center. (The platter will start turning.)
The start/stop switch goes on when the PU fixing plate is moved (rotated)?
PU fixing plate connection to start/stop switch defective.
Cathode voltage of D3 is 10V~13V DC?
T1 (Power-transformer)
S1 (Start/stop switch)
D1~D4 (Rectifier diode)
defective
Voltage between IC101 terminals 3 and 1 is 1.0V~1.4V DC?
IC101, D101
C104, Motor
defective
Voltage between FC3① and FC3② of drive P.C.B. is 3.0V~4.5V DC in 33 rpm and 4.0V~5.5V DC in 45 rpm?
Motor, C103
R101~R104
VR101, VR102
defective
No sound comes out.
Check the resistance at output pin plug (left and right channels).
0~ a few ohms
Check if shorted circuit at pin plug or lug terminal or connector or cartridge.
∞ (open)
Check if opened circuit at pin plug or lug terminal or connector or cartridge.
500~600Ω
Check if sequently connected to amplifier or check amplifier.

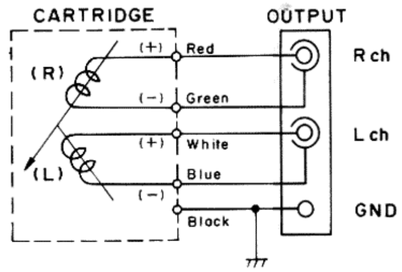
■ SCHEMATIC DIAGRAM



Notes:

1. S1: Power switch in **"on"** position.
2. S101: Speed selector switch in **"33"** position.
3. The values are of the reference voltage for the turntable rotation (33 rpm) of this unit, measured by a DC voltmeter (high impedance) on the basis of chassis. So, some error might be included depending on the internal impedance of the measuring instrument and the unit measured.
   * ( ): voltage in 45 rpm.
4. Important safety notice:
   Components identified by a ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
5. VR101 is the 33-1/3 rpm speed adjustment variable resistor.
6. VR102 is the 45 rpm speed adjustment variable resistor.
7. This schematic diagram may be modified at any time with the development of new technology.

* The part No. of transistors, IC and diodes mentioned in the schematic diagram stand for production part No. Regarding the part No. with ✪ mark, the production part No. are different from the replacement part No. Therefore, when placing an order for replacement part, please use the part No. in the replacement part list.

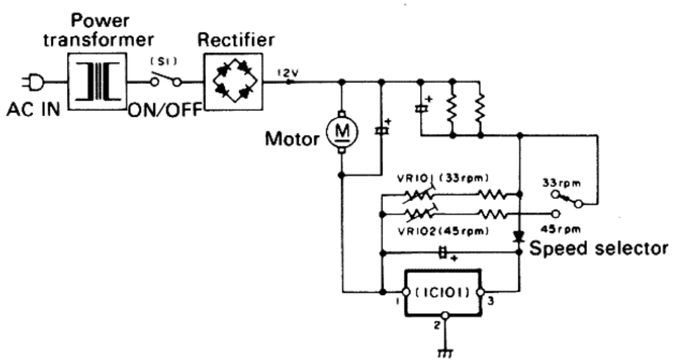


Caution!

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

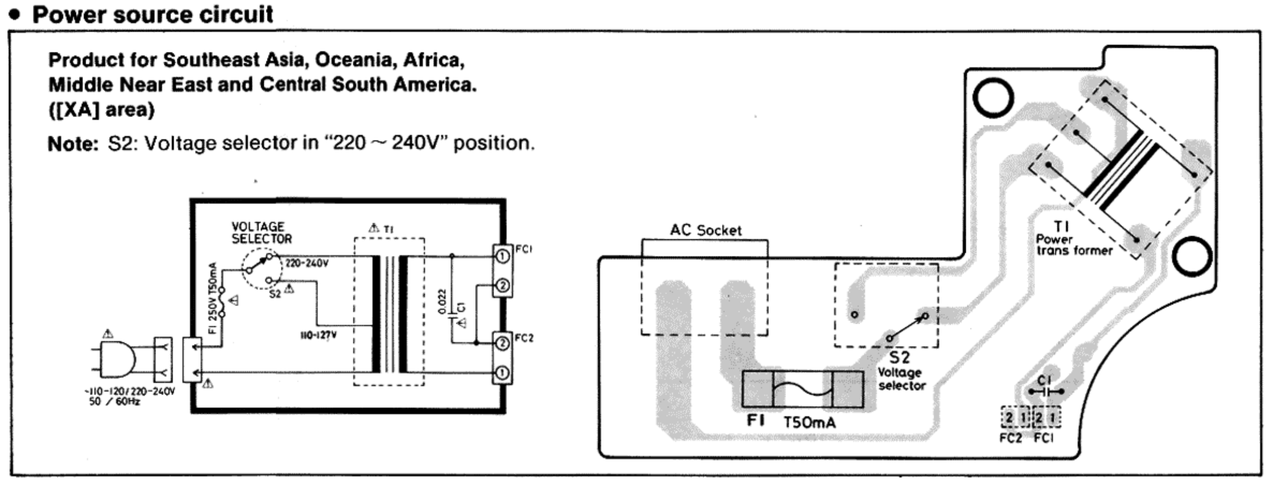
• Block diagram



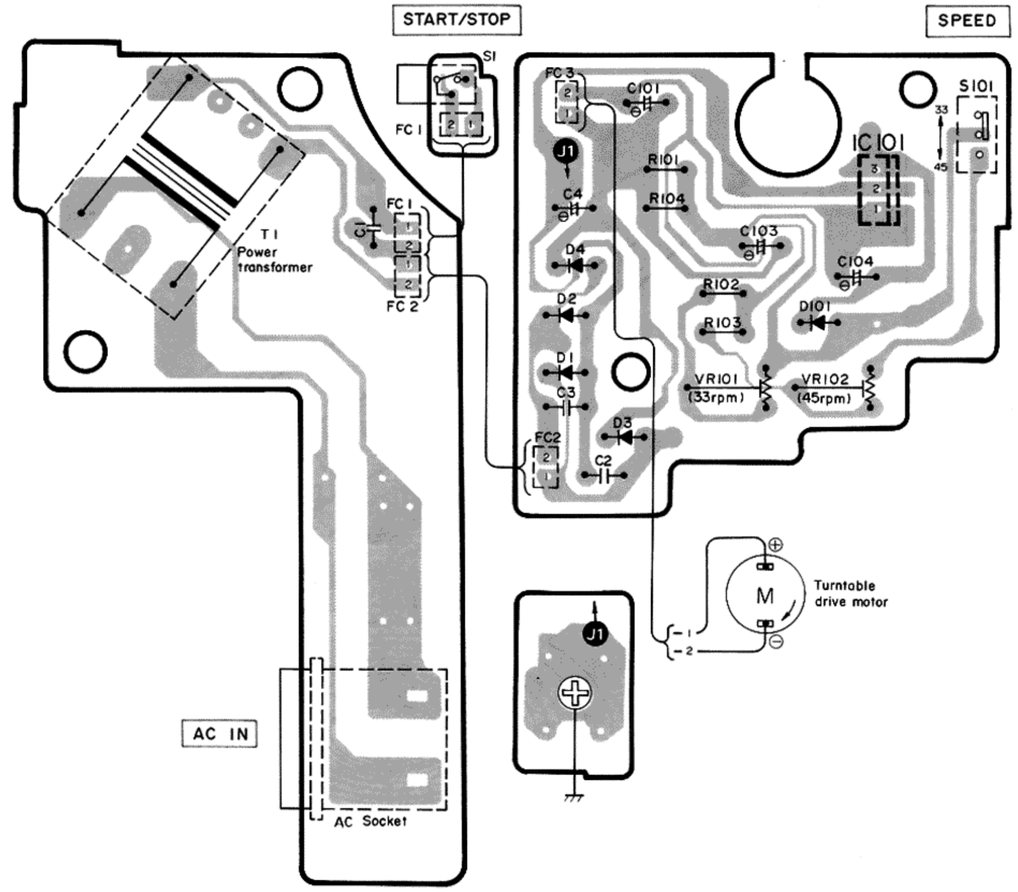
• Power source circuit

Product for Southeast Asia, Oceania, Africa, Middle Near East and Central South America. ([XA] area)

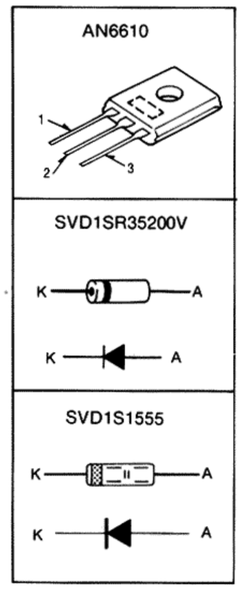
Note: S2: Voltage selector in "220 ~ 240V" position.



■ CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

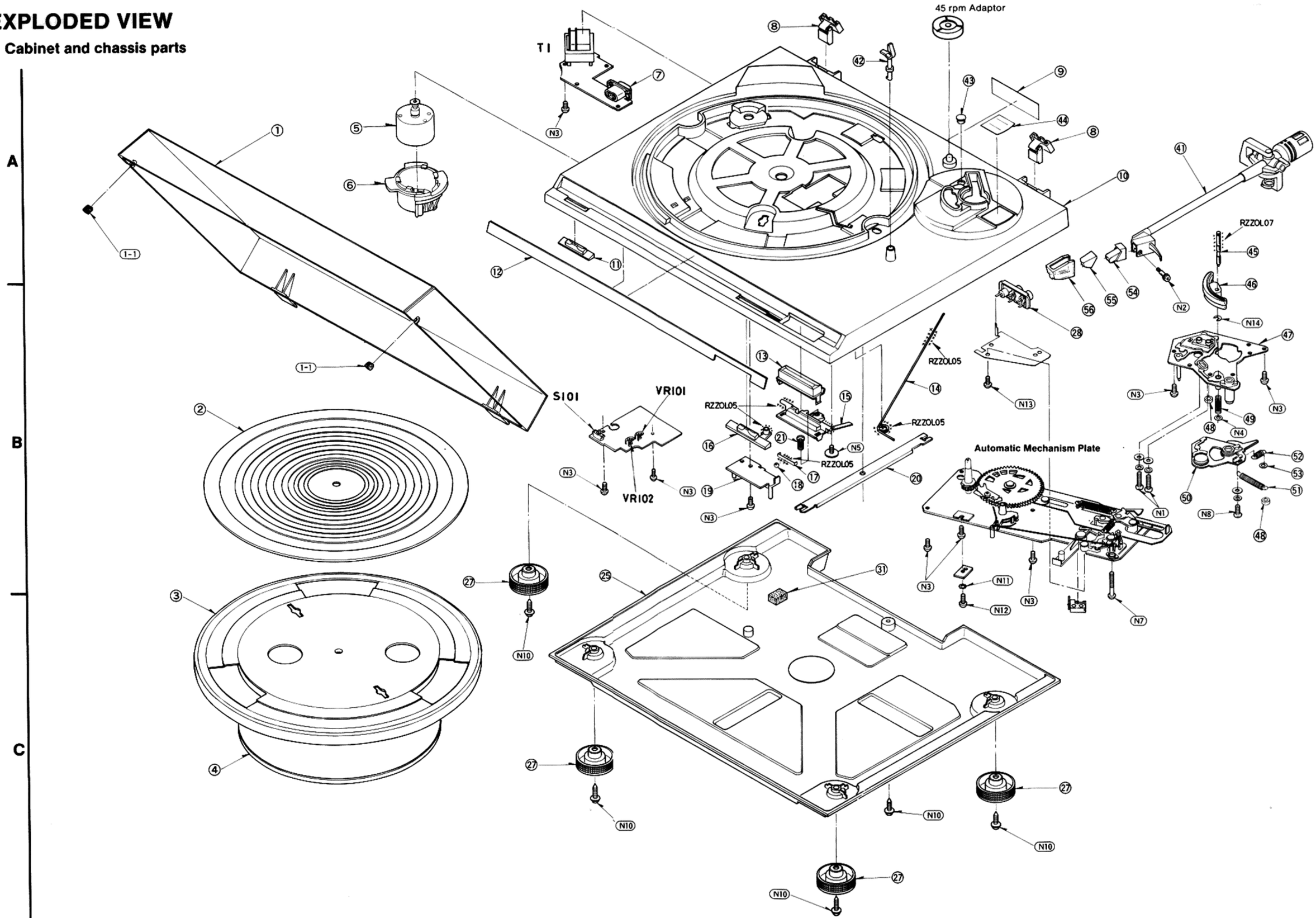


• Terminal guide of IC and diodes



■ EXPLODED VIEW

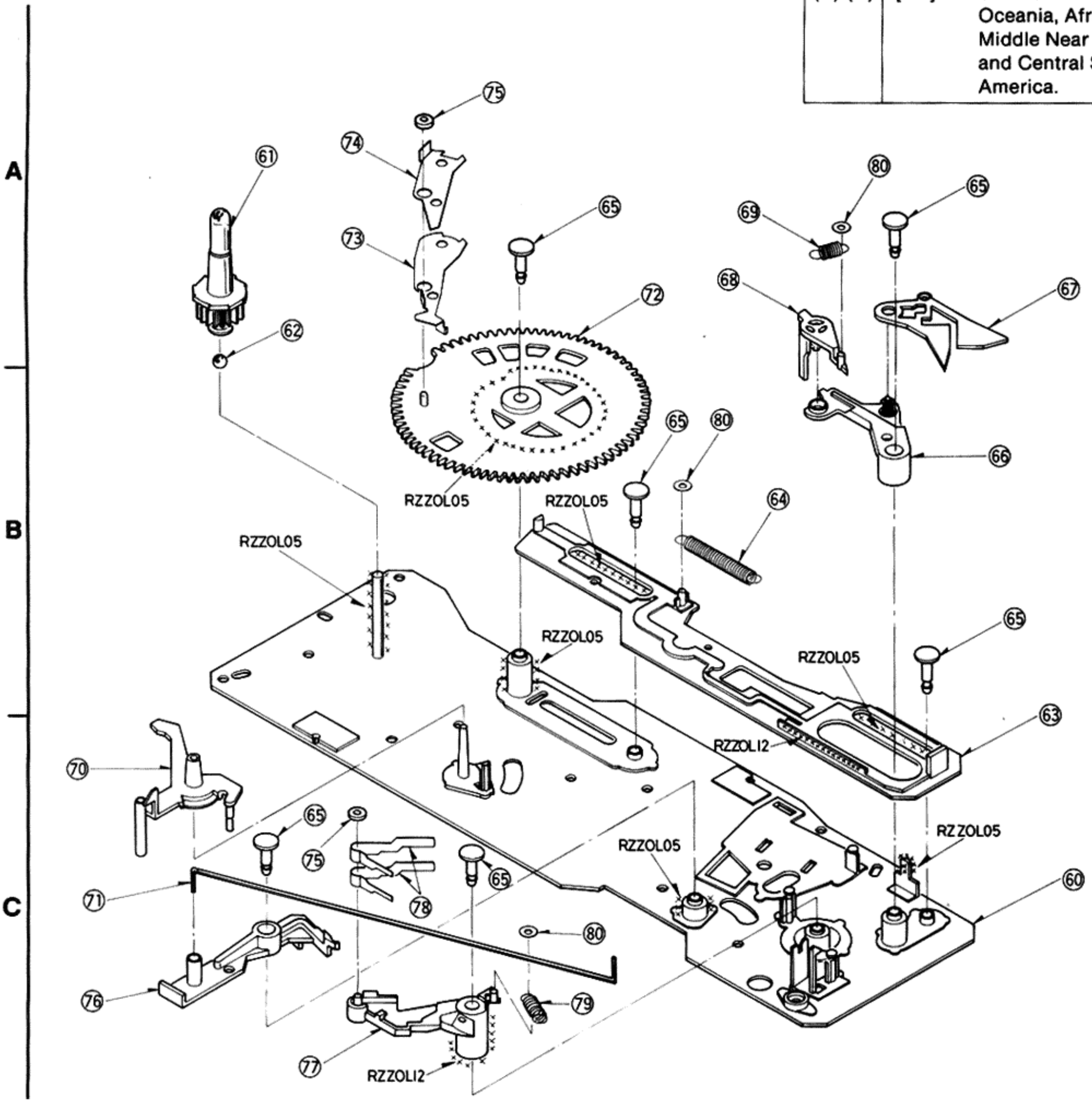
- **Cabinet and chassis parts**



| | | |

• Automatic mechanism parts

Color	Areas
(S) (K)	[E] ..... Switzerland and Scandinavia.
(S) (K)	[EK] .... United Kingdom.
(S) (K)	[XL] .... Australia.
(S) (K)	[EG] ... F.R. Germany.
(S) (K)	[EB] .... Belgium.
(S) (K)	[EH] .... Holland.
(S) (K)	[EF] .... France.
(S) (K)	[Ei] ..... Italy.
(S) (K)	[EC] .... Czechoslovakia.
(S) (K)	[XA] .... Southeast Asia, Oceania, Africa, Middle Near East and Central South America.



| | | |

■ REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice:
   Components identified by a ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
3. Ⓚ-marked parts are used for black type only, while ○-marked parts are used for silver type only.
4. Parts other than Ⓚ- and ○-marked are used for both black and silver types.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
6. The "Ⓢ" mark is service standard parts and may differ from production parts.
7. The parenthesized numbers in the column of description stand for the quantity per set.

Ref. No.	Part. No.	Description
INTEGRATED CIRCUIT		
IC101	AN6610	DC Servo Control
DIODES		
D1~4 ⚠	SVD1SR35200V	Rectifier
D101 Ⓢ	MA162A	Switching
SWITCHES		
S1 ⚠	SFDSD72R01	Power (start/stop)
S2 [XA] only ⚠	SFDSHXW02067	Voltage Selector
S101	SFDSHSW0834	Speed Selector
POWER TRANSFORMERS		
T1 [XA] ⚠	SLT35K63E	Power Source
T1 [EK, XL] ⚠	SLT35KE78E	Power Source
T1 [other] ⚠	SLT35K59E	Power Source
VARIABLE RESISTORS		
VR101	EVN61AA00B24	Speed Adjustment (33rpm), 20kΩ (B)
VR102	EVN61AA00B53	Speed Adjustment (45rpm), 5kΩ (B)
FUSE		
F1 [XA] only ⚠	XBA2C005TIW	250V, T50mA
RESISTORS		
R101	ERDS2TJ182	Carbon, 1/4W, 1.8kΩ, ±5%
R102	ERDS2TJ101	Carbon, 1/4W, 100Ω, ±5%
R103	ERDS2TJ101	Carbon, 1/4W, 100Ω, ±5%
R104	ERDS2TJ102	Carbon, 1/4W, 1kΩ, ±5%
CAPACITORS		
C1~3 ⚠	ECQM1223KZ	Polyester, 100V, 0.022μF, ±10%
C4	ECEA1CU331	Electrolytic, 16V, 330μF
C101	ECEA1HU010	Electrolytic, 50V, 1μF
C103	ECEA1CU470	Electrolytic, 16V, 47μF
C104	ECEA1EU3R3	Electrolytic, 25V, 3.3μF
CABINET AND CHASSIS PARTS		
1	SFADZ15R01E	Dust Cover (With Cushion Rubber) (1)
1-1	SFGZD04N01	Rubber Cushion, Dust Cover (2)
2	SFTGB93M01	Turntable Mat (1)
3	SFTEB83M01	Turntable Platter (1)
4	SFGBZ15R01	Belt (1)
5	SFMHB83M01E	Motor (1)
6	SFUMBD2N08	Cushion Rubber, Motor (1)
7 [XA, XL] ⚠	SFDJHSC0509	AC Socket (1)
7 [other] ⚠	SFDJHSC0515	AC Socket (1)
8	SFATZ15R01A	Hinge (2)
9 [EG]	SFNNBD5R01	Name Plate (1)
9 [EK, XL]	SFNNBD5L01	Name Plate (1)
9 [E, EC]	SFNNBD5S01	Name Plate (1)
9 [XA]	SFNNBD5X01	Name Plate (1)
9 [other]	SFNNBD5Q01	Name Plate (1)

Ref. No.	Part. No.	Description
10 ○	SFACB83M01	Cabinet (1)
10 Ⓚ	SFACB83M21	Cabinet (1)
11	SFKTBD2N03	Knob, Speed Selector (1)
12 ○	SFKKBD5R01	Ornament Plate (1)
12 Ⓚ	SFKKBD5R21	Ornament Plate (1)
13	SFKTBD2N01	Knob, Stop (1)
14	SFUZZ15R01	Rod, Stop Knob (1)
15	SFUMBD2N01	Base, Stop Knob (1)
16	SFKTBD2N02	Knob, Cueing (1)
17	SFQPZ15R02	Spring Plate (1)
18	SFYB-5-32	Ball (1)
19	SFUMBD2N02	Bracket, Cueing Knob (1)
20	SFUMBD2N03	Lever, Cueing (1)
21	SFQHZ15R01	Spring, Stop Knob (1)
25	SFAUBD2N01	Bottom Cover (1)
27	SFGABD5R01	Insulator (4)
28 [XA]	SFDJBD2N01	Jack, Output (1)
28 [other]	SFDJBD2S01E	Jack, Output (1)
31	SFUZBD2N01	Rubber Cushion (1)
TONEARM PARTS		
41	SFPAMBD201A	Tonearm (1)
42	SFKUZ15R01	Tonearm Rest (1)
43 ○	SFGK170-01	Cap (1)
43 Ⓚ	SFGK171F01	Cap (1)
44	SFKKZ15R01	Plate, Canceller (1)
45	SFXJBD2N51	Shaft, Arm Lift (1)
46	SFUMBD2N51	Arm Lift (1)
47	SFUPBD2N51E	Arm Base (1)
48	SFGZZ15R02	Cap (2)
49	SFQAZ15R53	Spring (1)
50	SFUPBD2N52E	Plate, Pick-up Mounting (1)
51	SFQHZ15R55	Spring (1)
52	SFQHZ15R51	Spring (1)
53	SFUMZ15R57	Stopper (1)
54	EPC-P24S	★ Cartridge (1)
55	EPS-24CS	★ Stylus (1)
56	SFCNC05101	Cover, Stylus (1)
AUTOMATIC MECHANISM PARTS		
60	SFUKBD2N51E	Mechanism Plate (1)
61	SFTUN05N02A	Turntable Shaft (1)
62	SFYB-5-32	Ball (1)
63	SFUBZ15R51	Plate, Drive (1)
64	SFQHZ15R54	Spring, Drive Plate (1)
65	SFUMZ15R56	Pin (6)
66	SFUMZ15R54	Switch Lever (A) (1)
67	SFUMZ15R59	Switch Lever (B) (1)
68	SFUMZ15R55	Switch Lever (C) (1)
69	SFQHZ15R52	Spring (1)
70	SFUMZ15R52	Lever, Actuating (1)
71	SFQSZ15R51	Rod, Actuating (1)
72	SFUGZ15R51	Main Gear (1)
73	SFURZ15R52	Link, Main Gear (A) (1)
74	SFURZ15R51	Link, Main Gear (B) (1)
75	SFUMZ15R61	Washer (2)
76	SFUMZ15R51	Lever, Cueing (1)
77	SFUMZ15R60	Cam, Cueing (1)
78	SFQPZ15R53	Spring Plate (2)
79	SFQHZ15R56	Spring Cueing (1)
80	SFXWZ15R51	Washer (3)

Ref. No.	Part. No.	Description
SCREWS AND WASHERS		
N1	XYN3+F12	Screw, ⊕3×12 (2)
N2	SFPEV0Q601	Screw, Cartridge (1)
N3	XTV3+8G	Screw, ⊕3×8 (9)
N4	SFXWZ15R51	Washer (1)
N5	SFXGQ06N01	Screw (1)
N7	XTV3+30J	Screw, ⊕3×30 (1)
N8	SFXGQ34N02	Screw (1)
N10	XTW3+14QFYR	Screw, ⊕3×14 (5)
N11	XWC3B	Washer, φ3 (1)
N12	XYE3+EJ8	Screw, ⊕3×8 (1)
N13	XTV3+16BFZ	Screw, ⊕3×16 (1)
N14	XUC3FY	Washer, φ3 (1)
ACCESSORIES		
A1 [EG]	SFNUBD5R01	Instruction Book (1)
A1 [EF]	SFNUBD5F01	Instruction Book (1)
A1 [EK]	SFNUBD5G01	Instruction Book (1)
A1 [XL, XA]	SFNUBD5X01	Instruction Book (1)
A1 [Ei]	SFNUBD5I01	Instruction Book (1)
A1 [other]	SFNUBD5S01	Instruction Book (1)
A2	SFDHBD2N01	Output Cord (1)
A3 [XA] only	SFDLJ02N11E	Ground Wire (1)
A4	SFWE212-01	45 Adaptor (1)
A5 [XL] ⚠	SFDAC05L01	AC Cord (1)
A5 [EK] ⚠	SFDAC05G02	AC Cord (1)
A5 [XA] ⚠	SFDAC05X02	AC Cord (1)
A5 [other] ⚠	SFDAC05E02	AC Cord (1)
A6 [XA] only ⚠	SFDKI19118	Plug (1)
PACKING PARTS		
P1 [EF] ○	SFHPBD5F01	Carton Box (1)
P1 [other] ○	SFHPBD5S01	Carton Box (1)
P1 [EF] Ⓚ	SFHPBD5F21	Carton Box (1)
P1 [other] Ⓚ	SFHPBD5S21	Carton Box (1)
P2	SFHHBD2N01	Pad, Left (1)
P3	SFHHBD2N02	Pad, Right (1)
P4	SFHKB63M01	Clamper, Turntable Platter (1)
P5	SFHZBD2N01	Clamper, Tonearm (Back) (1)
P6	SFHZZ15R03	Clamper, Tonearm (1)
P7	SFHZZ15R02	Clamper, Cord (1)
P8	SFYP75A41	Sheet (1)
P9	SFYH60×60	Polyethylene Bag, Unit (1)
P10	SFYH52×50	Polyethylene Bag, Dust Cover (1)
P11	SFYH17×16	Polyethylene Bag, Cord (1)
P12	SFYF32A35	Polyethylene Bag, Turntable Mat (1)
P13	SFHDBD2N01	Pad, Turntable Mat (1)

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